WHAT IS CLAIMED IS:

1. A fusion welding method for welding a first member having a first interface surface with a second member having a second interface surface, the first and second interface surfaces being disposed in contact and fusion welded, wherein:

the first member is made of a first metal free of at least one identified element that can form a continuous layer of a brittle intermetallic compound at the first interface surface;

the second member is made of a second metal that includes the at least one identified element; and,

energy is generated at the first and second interface surfaces in a combination of an amount and for a first time selected to be sufficient to heat the interface surfaces to a fusion welding temperature, the first time being less than a second time that enables formation at the fusion welding temperature of the continuous layer of the brittle intermetallic compound at the interface surfaces.

2. The method of claim 1 in which:

the first metal is based on at least one element selected from the group consisting of Ru, Rh, Pd, and Pt;

the second metal is a high temperature alloy based on at least one of Fe, Co, and Ni; and,

the first time is less than about one second.

3. The method of claim 2 in which the second metal is a high temperature Ni base alloy in which the identified element is Al.

4. The method of claim 2 in which the first time is no greater than about 10 microseconds..

5. The method of claim 1 in which an interlayer metal that is free of the at least one identified element is bonded with the second interface surface of the second member prior to energy being generated, the interlayer metal including a third interlayer interface

surface, the energy being generated at the first and third interface surfaces in the combination.

6. The method of claim 5 in which the interlayer metal is based on at least one element selected from the group consisting of Cr, Ni, Pd and their alloys and mixtures.

7. The method of claim 1 for repairing a damaged portion of a turbine engine blading member in which the second member is an airfoil that includes the damaged portion, and the first member is a replacement member including the first interface surface; wherein:

the damaged portion is removed from the second member to provide the second interface surface;

the replacement member is disposed so that the first interface surface is in contact with the second interface surface as the energy is generated to fusion weld the replacement member to the airfoil.

8. The method of claim 7 in which:

the first metal is based on at least one element selected from the group consisting of Ru, Rh, Pd, and Pt;

the second metal is a high temperature alloy based on at least one of Fe, Co, and Ni; and,

the first time is less than about one second.

9. The method of claim 8 in which the damaged portion is at a radially outer tip portion of the airfoil.

10. The method of claim 9 in which an interlayer metal that is free of the at least one identified element is bonded with the second interface surface of the second member prior to energy being generated, the interlayer metal including a third interlayer interface surface for contact with the first interface surface, the energy being generated at the first and third interface surfaces in the combination.

11. The method of claim 8 in which the damaged portion is at least one discrete outer surface portion of the airfoil.

12. The method of claim 1 in the form of a percussion arc fusion welding method for welding a first member having a first interface surface with a second member having a second interface surface, the method comprising disposing the first and second interface surfaces in contact with an ignition member therebetween while passing electric current energy through the surfaces and the ignition member sufficient to vaporize the ignition member and to force together and fusion arc weld the interface surfaces, wherein:

the first member is made of an electrically conductive first metal free of at least one identified element that can form a continuous layer of a brittle intermetallic compound at the first interface surface;

the second member is made of an electrically conductive second metal that includes the at least one identified element;

the first and second interface surfaces are disposed in juxtaposition across a gap therebetween;

at least one ignition member made of a third electrically conductive metal free of the at least one identified element is disposed in the gap;

a force is applied to press the first and second interface surfaces toward and into contact with the at least one ignition member to provide an electrically conductive path through the first member, the at least one ignition member, and the second member; and then,

the first and second members are fusion welded at the first and second interface surfaces by passing through the electrically conductive path a flow of electric energy in an amount and for a first time sufficient to vaporize the at least one ignition member into a plasma jet that cleans the first and second interface surfaces and provides a medium for an electric arc to pass between and heat the first and second interface surfaces to a fusion welding temperature as the force moves the first and second interface surfaces into contact,

the first time being less than a second time that enables formation at the fusion welding temperature of the continuous layer of the brittle intermetallic compound at the interface surfaces.

13. The method of claim 12 in which:

the first metal is based on at least one element selected from the group consisting of Ru, Rh, Pd, and Pt;

the second metal is a high temperature alloy based on at least one element selected from the group consisting of Fe, Co and Ni; and,

the third metal is based on at least one of Fe, Co, Ni, Ru, Rh, Pd, and Pt.

14. The method of claim 12 in which the first time for the flow of electric energy is a brief burst of less than about one second.

15. The method of claim 14 in which the first time is no greater than about 10 microseconds.

16. The method of claim 12 in which an interlayer metal that is free of the at least one identified element is bonded with the second interface surface of the second member prior to energy being generated, the interlayer metal including a third interlayer interface surface, the energy being generated at the first and third interface surfaces in the combination.

17. The method of claim 16 in which the interlayer metal is based on at least one element selected from the group consisting of Cr, Ni, Pd and their alloys and mixtures.

18. The method of claim 12 for repairing a damaged portion of a turbine engine blading member in which the second member is an airfoil that includes the damaged portion, and the first member is a replacement member including the first interface surface; wherein:

the damaged portion is removed from the second member to provide the second interface surface;

the replacement member is disposed so that the first interface surface is in contact with the second interface surface as the energy is generated to fusion weld the replacement member to the airfoil.

19. The method of claim 18 in which:

the first metal is based on at least one element selected from the group consisting of Ru, Rh, Pd, and Pt;

the second metal is a high temperature alloy based on at least one of Fe, Co, and

the first time is less than about one second.

20. The method of claim 19 in which the damaged portion is at a radially outer tip portion of the airfoil.

21. The method of claim 19 in which the damaged portion is at least one discrete outer surface portion of the airfoil.

22. A welded article comprising:

a first member made of a first metal free of at least one identified element that can form a continuous layer of a brittle intermetallic compound with the first metal; and,

a second member made of a second metal that includes the at least one identified element;

the first and second members being fusion welded at a weld that is free of the continuous layer of the brittle intermetallic compound.

23. The article of claim 22 in which the weld has a heat affected zone of no greater than about 10 mils.

24. The article of claim 22 in which:

the first metal is based on at least one element consisting of Ru, Rh, Pd, and Pt; and,

the second metal is a high temperature alloy based on at least one element selected from the group consisting of Fe, Co, and Ni.

25. The article of claim 22 in the form of a turbine engine blading member in which:

the second member is a blade airfoil including a radially outer tip portion; and,

the first member is fusion welded to the radially outer tip portion.

26. The article of claim 22 in which:

the second member is a blade airfoil including an outer surface; and,

the first member is fusion welded to at least one discrete portion of the airfoil outer surface.